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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,119	08/01/2003	Wen Li	121652 (GEGRC 0101 PA)	3661

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EXAMINER

HO, ALLEN C

ART UNIT PAPER NUMBER

2882

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/633,119

Applicant(s)

LI ET AL.

Examiner

Allen C. Ho

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per

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 082004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 48. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

2. Fig. 1 is objected to because the reference number 24 should be replaced by 48.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:

Paragraph [0017], line 5, "28" should be replaced by --29--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5 and 7-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Shahar *et al.* (U. S. Patent No. 5,905,264).

With regard to claims 1, 3-5, 7, 9-12, and 14-16, Shahar *et al.* disclosed an imaging system comprising: an x-ray source (column 3, lines 57-63); a detector array (Fig. 2) comprising a plurality of direct conversion detector elements (200) configured to convert x-ray photons into electric current, each of the plurality of direct conversion detector elements comprising: a cathode surface (202); an anode surface (203) having a plurality of anode side edges; a plurality of detector side surfaces (210) connecting the cathode surface to the anode surface; a pixel array assembly (203) positioned on the anode surface, the pixel array assembly including a plurality of pixel side edges; and a guard ring (212) mounted around the plurality of detector side surfaces,

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the guard ring including an upper ring edge, a lower ring edge, and a ring outer surface including a guard ring height, the ring outer surface positioned coplanar with the pixel side edges.

With regard to claims 2 and 13, Shahar *et al.* disclosed an imaging system as in claims 2 and 11, further comprising a voltage source biasing the guard ring with a bias voltage (V2).

With regard to claim 8, Shahar *et al.* disclosed an imaging system as in claim 1, wherein the direct conversion detector element comprises a CdTe detector (column4, lines 46-52).

With regard to claim 17, Shahar *et al.* disclosed a method of improving the performance of peripheral pixel elements positioned on an anode surface (203) of a direct conversion detector element, the direct conversion detector element having a cathode surface (202) and a plurality of detector side surfaces, comprising: applying a guard ring (212) around the plurality of detector side surfaces, the guard ring applied coplanar to the peripheral pixel elements.

With regard to claim 18, Shahar *et al.* disclosed a method as described in claim 17, further comprising: applying a bias voltage (V2) to the guard ring.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shahar *et al.* (U. S. Patent No. 5,905,264) as applied to claim 1 above, and further in view of Lee *et al.* (U. S. Patent No. 5,563,421).

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With regard to claim 6, Shahar *et al.* disclosed an imaging system as in claim 1. However, Shahar *et al.* failed to teach that the direct conversion detector element comprises amorphous selenium.

Lee *et al.* disclosed amorphous selenium as a conversion material (column 4, lines 8-24).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ amorphous selenium in the direct conversion element, since a person would be motivated to use a material that has demonstrated usability as an x-ray conversion material.

8. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shahar *et al.* (U. S. Patent No. 5,905,264) as applied to claim 17 above.

With regard to claims 19 and 20, Shahar *et al.* disclosed a method as in claim 17. However, Shahar *et al.* failed to teach the steps of adjusting a guard ring height and a guard ring position.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to adjust a guard ring height and a guard ring position, since a person would be motivated to optimize the effectiveness of the electric field produced by the guard ring.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- (1) Perner *et al.* (U. S. Patent No. 6,545,711 B1) disclosed a photodiode pixel sensor array having a guard ring.

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- (2) Pyyhtiä *et al.* (U. S. Patent No. 6,380,528 B1) disclosed an imaging device.
- (3) Shahar *et al.* (U. S. Patent No. 6,034,373) disclosed a semiconductor radiation detector with reduced surface effects.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allen C. Ho
Patent Examiner
Art Unit 2882

24 December 2004